NOTES ON THE LIFE HISTORY OF *BINDAHARA PHOCIDES YURGAMA* COUCHMAN (LEPIDOPTERA: LYCAENIDAE)

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Abstract

The egg, last instar larva and pupa of *Bindahara phocides yurgama* Couchman are described and notes on the life history provided.

Introduction

The Australian Plane, *Bindahara phocides yurgama* Couchman (1965), occurs in northern Queensland, from the islands of Torres Strait south to Townsville (Common and Waterhouse, 1981). It is associated with rainforest habitats, ranging from montane areas such as Kuranda to coastal areas such as Cape Tribulation and Clump Point.

The early stages of the Australian subspecies have not been described although Manski (1960) recorded larvae feeding on the seeds within the berries of *Salacia chinensis* L. (Hippocrateaceae). *Salacia* is common along the beach front at Cape Tribulation, about 100 km north of Cairns, and both eggs and larvae of *Bindahara* have been collected there from it on numerous occasions. The information below is the result of those collections.

Life History

EGG (Fig. 1)

White; flatter than hemispherical, micropylar area slightly depressed; surface with a fine reticulated pattern of pits and intervening ridges. Diameter 0.8 mm, height 0.6 mm.

MID INSTAR LARVA

Similar to last instar.

LAST INSTAR LARVA (Fig. 2)

Head pale brown, thoracic and abdominal segments mottled: segment 1 yellow, with pale central depression, posterior margin black; segment 2 yellow, black around dorsal tubercles and centre strip; segments 3, 4, 5 very pale pink, dorsal and lateral tubercles brown to black, sides of segment 8 very pale pink; segment 9 very pale pink, dorsal and lateral tubercles brown to black; segment 10 very pale pink, edges slightly darker. Slight blue coloration around black markings on all segments. Ventral surface pale yellow, prolegs darker yellow. Segments 2-9 with pairs of low dorsal and lateral tubercles, segments 2 and 3 with a third pair between,others with a wrinkled pitted appearance between. Dorsal tubercles of segments 3-8 each with a pair of long, black stout setae, other tubercles with a group of 2-6

similar setae. Front half of segment 1 with similar setae over entire surface, and segment 10 with similar but paler setae fringing margin. Rest of surface with short, black setae scattered irregularly over surface. Medial dorsal organ and dorsolateral organs not developed. Anal segment enlarged, flattened. Length 16 mm, width 4 mm.

PUPA (Figs 5, 6)

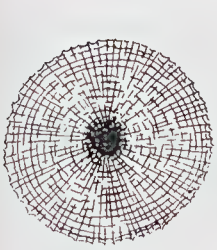
Pale brown, dorsal parts of thorax tending towards pinkish white with dark brown speckling, pair of brownish black spots on middle part of thorax. Pair of dorsal elongate tubercles of thorax, surface roughened. Dorsal surfaces of thorax and abdomen covered with pale erect hairs. Fastened by anal hooks and central girdle to silken pad. Length 10 mm, width 4 mm.

NOTES

Eggs are laid singly on the fruit usually at the base where it joins the stem (Fig. 3) or occasionally on other parts of the fruit, especially on skin blemishes. Up to three eggs have been observed on each fruit but subsequently only one larva was found in each fruit. The first instar larva mines directly through the rind into the seed and feeds internally, ejecting its faecal pellets through a hole in the rind. As in other related genera (*Deudorix, Virachola*) the larva plugs this hole with its toughened anal plate when not feeding (Fig. 4). The larva feeds on the seed of the fruit, leaving the flesh and rind intact, only vacating the fruit when development is complete. More than one fruit may be required in its lifetime. Mid-instar larvae which left the fruit and showed no interest in feeding in subsequent fruit, were invariably parasitized by a braconid wasp (*Apanteles* sp.).

Pupae were not found in the field and the preferred pupation site is thus not known. In the laboratory, full grown larvae always left the fruit, and no fruit were ever collected with pupae inside, so in contrast to *Virachola, Bindahara* would seem to pupate outside the fruit. Woodhouse (1949) records that the Shri Lankan subspecies leaves the fruit and probably burrows into bark, as individuals would not pupate unless provided with cork in which to burrow. This was not the case here as the larvae made no attempt to burrow in cork provided. When offered containers of restricted size pupation took place on the sides of the containers. When kept in larger containers, mortality of fully developed larvae occurred from what would seem an inability to find a suitable pupation site; this mortality was reduced by providing pieces of dried bark or old dried fruit rinds in which to pupate. Pupal duration was 10-17 days.

The food plant, *Salacia chinensis* L. is a vigorous woody scrambler growing as a low shrub, liana or rarely a small tree (Jones and Gray, 1977). It is widely distributed through India, South-east Asia, and into far northern Queensland (Ding Hou, 1964). In Australia it is found only in coastal areas along sandy foreshores and possibly sandy river banks. The related *S. disepala* (C. T. White) occurs in rainforests away from the coast and at higher



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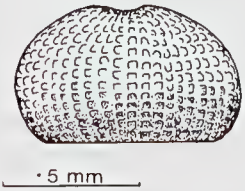

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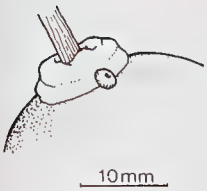

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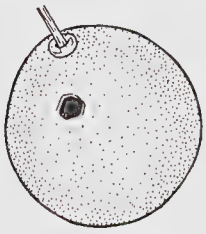

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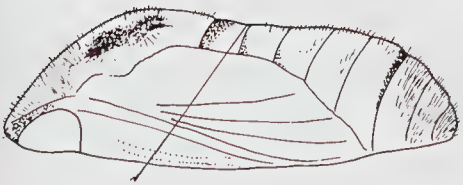

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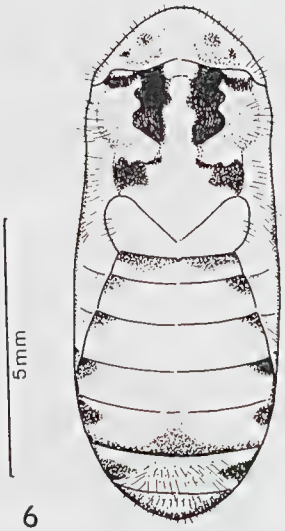

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Figs 1-6. *Bindahara phocides yurgama* Couchman: (1) egg; (2) final instar larva; (3) *Salacia* berry with egg *in situ*; (4) *Salacia* berry with hole in rind; (5) lateral view of pupa; (6) dorsal view of pupa.

elevations (Clarkson, pers. comm.) and is possibly the host of *Bindahara* in such areas. The ripe fruit is ovoid in shape, bright orange to red, 2-3.5 cm in length. Each fruit contains a pair of large, hard seeds, surrounded by a thin layer of opaque white pulp (which is edible) then finally the soft red rind. Peak fruiting periods at Cape Tribulation were August and December, though some mature fruit were found at all times when visits were made, allowing continuous breeding of *Bindahara*. Immatures were collected in June through to December. Adults were taken in June, August, September and November, flying around the food plant or feeding on nearby blossom.

Acknowledgements

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RHYOTHEMIS GRAPHIPTERA (RAMBUR) (ODONATA: LIBELLULIDAE), A NEW RECORD FROM CENTRAL AUSTRALIA

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A female of the dragonfly *Rhyothemis graphiptera* (Rambur) (Odonata: Libellulidae), was collected at Alice Springs, Northern Territory on 9 February, 1982. This species is widely distributed across northern and eastern Australia and is known from some inland areas (Watson 1974). However, specimens were not collected in past surveys at Tennant Creek (Tillyard 1908) or in central Australia (Griffin 1979).

A previously unreported sighting of an individual of this species was made near Alice Springs in December, 1975. At the times of the 1975 sighting and the 1982 collection, central Australia was being affected by northern monsoonal airflows. While the collected specimen was in remarkably good condition it seems likely to have had a northern origin.

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